DOCUMENT RESUME

ED 428 831 PS 027 058

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TITLE Shaping Youngest Minds. Study Guide [and Videotape].
INSTITUTION Learning Seed, Lake Zurich, IL.
ISBN ISBN-0-917159-93-6
PUB DATE 1999-00-00
NOTE 19p.
AVAILABLE FROM Learning Seed, 330 Telser Road, Lake Zurich, IL 60047-6701; Tel: 800-634-4941 (Toll Free); e-mail: LEARNSEED@AOL.COM; Web site: http://learningseed.com (Study Guide and 24-minute VHS videotape) ($89).
PUB TYPE Guides - Non-Classroom (055) -- Non-Print Media (100)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Brain; Childhood Needs; Cognitive Development; Developmental Stages; Emotional Development; *Infants; Influences; Neurology; *Parent Child Relationship
IDENTIFIERS *Brain Development

ABSTRACT

Noting research indicating that the flow of interaction with infants influences their brain development, this viewer's guide and videotape examine characteristics of early brain development and how parents can positively affect the infant's development in a number of areas. The first part of the viewer's guide provides an overview of the videotape, viewing objectives, and questions for discussion and research in the context of parenting education classes. The remainder of viewer's guide highlights information from the videotape, including new insights on the brain, how brain cells form connections, and behavioral effects of prenatal drug and alcohol exposure. Also highlighted are ways to soothe a fussy baby, guidelines for talking to an infant at different ages, and characteristics of quality day care settings. The accompanying videotape notes that both heredity and experience affect a child's development, and explores the anatomy of brain development and how various factors stimulate or hinder that development, including abuse and neglect. The videotape then explores six ways parents can positively affect their child's brain development: (1) maintaining good health and nutrition during pregnancy and for the newborn; (2) talk, read, and sing to infants in a loving voice; (3) use a loving touch; (4) comfort infants when they are distressed; (5) take care of mom and dad, including the importance of fathers and of obtaining adequate resources before having a baby; and (6) become involved in the child's day care or preschool. (HTH)

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Shaping Youngest Minds

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Study Guide

Shaping Youngest Minds

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Contents

Shaping Youngest Minds contains a 23 minute close-captioned videotape and this guide. Owners of the program may duplicate the guide for classroom use only. Catalog Number 239. ISBN 0-917159-93-6.

Overview

This video is about the day-to-day care of young children's brains. The latest scientific findings on how brains develop are a wake-up call to parents and caregivers.

The inflow of sights, sounds, noises, smells, touches, language and eye contact literally shapes the brain. A mother comforting her baby, a father playing peekaboo with his child, a caregiver reading to a child are all engaged in brain shaping.

At birth, the brain is remarkably unfinished; its 100 billion neurons are not yet connected. How the brain is "wired" for life depends on how the child experiences the world and forms attachments to parents, family, and caregivers. We both "inherit" our brains AND "grow" them.

Robin Karr-Morse, co-author of ***Ghosts from the Nursery: Tracing the Roots of Violence*** explains how a child who is abused or neglected may develop a brain very different from a baby raised in a loving home. She suggests ways to nurture youngest minds.

Objectives

After watching this video, viewers will be introduced to these concepts:

❑ That life experiences shape the chemistry of the brain.

❑ Prime times and critical periods for learning.

❑ The relationship of violent behavior and early brain development.

❑ Prenatal care. Experience begins in the womb. A one pound fetus already has 100 billion brain cells. The possible risks from poor nutrition, nicotine and alcohol use while pregnant include learning disabilities.

❑ The importance of talking, reading, and singing to children. Surrounding a child with language, stories, songs, and conversation is critical to "growing" a brain.

❑ Using a loving touch. The baby's earliest human interactions form a road map of what to expect from future relationships.

❑ Comforting infants. Comforting is not merely a technique to stop crying; it also teaches emotional self-regulation.

❑ Choosing quality childcare to insure interaction with caring adults.

❑ Realizing that children of depressed mothers are less active and talkative.

For Discussion and Research

1. What new ideas about the brain did you learn from this video? Review "New Insights on the Brain" on page 11 of this guide.

2. Discuss how the brain continues developing after birth, using page 12 of this guide.

3. What can a parent do to stimulate brain pathways? *(Simple things like holding, talking, playing and singing trigger the brain pathways for sight, language and socialization.)*

4. What does "prime times" and "critical periods" mean in relationship to the brain?
(There are specific times when the brain is best at distinct kinds of learning.)

5. What does the video say about how learning to play a musical instrument affects the brain?
(A 35 year-old will have a tougher time learning a musical instrument than a child between five and 12 years old. Some researchers believe that children who learn how to play music may show improved spatial reasoning, which will help them understand math and scientific concepts.)

6. Advanced students could read and report on how **violence** begins in the brain referring to chapters 1 and 10 in ***Ghosts from the Nursery*** by Robin Karr-Morse and Meredith Wiley.

7. Advanced students could also read Bruce D. Perry's Article "Incubated in Terror: Neurodevelopmental Factors in the 'Cycle of Violence'" which appears in

Children in a Violent Society, (Joy Osofsky, Ed.). His book is ***Maltreated Children: Experience, Brain Development, and the Next Generation*** (1998). Perry argues that a great deal of violent behavior today may be connected to a lack of loving attachments early in life. Perry holds that persistent child neglect and trauma can cause the brainstem and midbrain to become overdeveloped. Overdevelopment of these areas is associated with anxiety, impulsivity, poor affect regulation, and hyperactivity. At the same time, the cortex, responsible for problem solving, becomes underdeveloped.

Prenatal Exposure to Drugs and Malnutrition

8. When is a child's brain most sensitive to malnutrition? (*From the third prenatal trimester through the second year after birth.*)

9. Research the effects of drugs during pregnancy by reading and reporting on Chapter 3, "Before We Know it: Prenatal Exposure to Drugs and Malnutrition" in ***Ghosts From the Nursery.***

10. Why is it beneficial to the baby if a pregnant woman ceases smoking during her pregnancy?
(*Smoking seems to do the most damage during the last four months of pregnancy. So stopping smoking even late in pregnancy is beneficial to the baby.*)

11. What are possible results to the child when a mother smokes during pregnancy?
(*Low birth weight, prematurity, possible learning disabilities, poor reading skills, attention deficits, hyperactivity.*)

12. Research fetal alcohol syndrome. What are possible learning problems associated with prenatal exposure to alcohol?
(Retardation, learning disabilities, behavior problems, including attention problems, hyperactivity, and distractibility.)

13. Duplicate and discuss **Behavioral Effects After Prenatal Drug Exposure** on page 13 of this guide.

14. What does the video say about a father's use of alcohol and a child's developing brain?
(Some researchers believe that alcohol may so alter a father's genes as to cause his children to produce insufficient quantities of the neurochemical serotonin. The children then may be prone to violent criminal behavior later, especially if they also drink alcohol.)

15. Have a student prepare a report on paternal use of alcohol, discussed on pages 226-229 in ***Ghosts from the Nursery.***

16. Discuss Nathaniel's experience as a cocaine-exposed fetus who is being raised in a loving, nurturing family.
Note: FAS Drug Policy Analysis Bulletin #4 is available on the internet at ***www.fas.org.*** In ***What Happened to Crack Babies?*** by Gary Emmett, it states:
"Women who use crack cocaine are more than twice as likely to deliver a low birth weight infant than socially matched controls . . . Newborns born to cocaine-using mothers do have clear neurological problems, and these problems may persist... They may have permanent change in their brain wave patterns with unknown long-term results . . .
Crack cocaine does not produce a syndrome: a clearly

recognizable series of abnormalities that is consistent from patient to patient. Exposing fetuses to cocaine may or may not have lasting consequences, but current research demonstrates that by the time the child reaches age five, the effect of the disastrous social situation that many crack cocaine users share with other economically deprived children washes out any measurable effect of the cocaine itself on these children's school performance . . .
In a long term study out of the poorest areas of Philadelphia Dr. Hallam Hurt has shown that the emotional impoverishment of the homes where women take crack cocaine has more significance on school performance by school entry that does the use of cocaine during the pregnancy (at least for those children who survived the neonatal period).
Multiple studies show that foster care may actually be worse for the child's evwentual outcome than being in the care of a crack-using mother... The most successful intervention has involved intensive teaching of mothering skills combined with drug rehabilitation . . .

Talk, Read and Sing to Children

17. How is talking, reading and singing to children important to their developing brains?
(The emotional relationship between the primary caregiver forms in part through words. Early exposure to language affects intelligence and social competence.)

18. Children need human interaction to attach meaning to words. How can a caregiver interact with children using words?
(Talk to them while doing everyday activities. Sing to them, tell stories and read books. Question and discuss with children what they read, see, and experience.)

19. To lead an in-depth discussion of how parents and caregivers can stimulate a child's language development, show the Learning Seed video ***Children Learning Language: How Adults Can Help.***

20. Discuss the handout "Talking to Your Baby, an Age by Age Guide" on page 15 of this guide.

Use Loving Touch & Comfort When Crying

21. How do babies learn to calm themselves, to regulate their own emotions?
(The experience of being comforted helps them learn to regulate their own emotions. Babies associate positive feelings like joy and comfort with the timely and sensitive ways a caregiver responds to them.)

22. How would you feel if you were the baby being told, "Shut up and take your nap! ...You're nothing but a spoiled little brat!"

23. Discuss these statements by Robin Karr-Morse:
"A baby whose cries result in immediate soothing and comfort is actually shaping a different kind of brain than a baby left to cry for long intervals or a baby whose cry is greeted with a slap or with mean words and walking away."

"A parent's sympathetic responses to the child's fears or needs-- patting, rocking, holding, soothing words, gentle voice tones, eye contact are all building connections and balancing chemistry in the baby's brain."

24. Find a doll which cries continually and try some of the soothing strategies suggested on page 14. Comfort a real baby, of course, if one is available.

Take Good Care of Mom and Dad

25. What is postpartum depression? What did the video say about depression among mothers?
(Studies indicate that 12 percent of mothers of young children are clinically depressed and 52 percent report depressive symptoms.
When mothers are seriously depressed, they find it hard to show immediate positive responses to their babies efforts, and to engage in interesting and fun interactions with them. They show more negative feelings toward their babies, smile less, and their faces are often still or frowning. These moms rarely laugh or use animated voices or a variety of tones when they speak.)

26. What can happen to the children of depressed mothers?
(Over time the children of these mothers reflect their mothers' depression. They are less active, talk less, avoid eye contact and are less playful. They seem to expect less of their relationships of other people in general. Between mothers and babies, depression can be "contagious.")

In an interview on ABC's ***Good Morning America*** *in 1997 Dr. Geraldine Dawson of the University of Washington explained her study on the effects of a mother's depression on 100 children. She explained, "We found that infants of mothers who were depressed were showing less activity in this part of the brain that is associated with positive emotion and more activity in this part of the brain that is associated with negative emotion."*
But there is hope for most children. Reversing a mother's depression can help the child because the brain remains somewhat malleable even after the preschool years.

27. Why are fathers important to children's brains? Have a student read and report on Chapter 9 in ***Ghosts from the Nursery,*** "Where's Poppa?". It says:
Correlative data show that children growing up without fathers are five times more likely to live in poverty. They are also more likely to repeat a grade in school, to be suspended or expelled from school, and to drop out. (231) In a study of almost 1000 babies, the mean IQ for African America preschoolers at age three increased by six points as a result of father involvement. (238)

Quality Child Care and Preschool

28. Discuss how to evaluate quality child care, using the handout on page 16. If viewers are currently parents, encourage them to share the best childcare available.

Wrap-up

29. Discuss the concluding statement of Robin-Karr Morse.
(Our experiences, especially our earliest experiences become physically built into our brain structure and chemistry. This begins in the womb and is particularly impactful in the first months of life. Experiences in the womb and our first 24 months after birth shape how we come to think and how we relate to other people as adults.)

Websight

I AM YOUR CHILD is a national public awareness campaign designed to help people understand the importance of new brain research and its implications for children's lifelong healthy development.
www.iamyourchild.org

New Insights on the Brain

Previous Belief	Current Belief
Brain development depends on genes.	Brain development an interplay between genes and experiences.
Life experience before age three has limited impact.	Experiences have a decisive impact on later development.
Secure relationship with primary caregiver creates favorable context for early development & learning	Early interactions directly affects the way the brain is "wired."
Brain development grows steadily as an infant progresses toward adulthood	There are prime times when a child acquires different kinds of knowledge and skills.
A toddler's brain is less active than a young adult's brain.	At age three, a child's brain is twice as active as a young adult's.

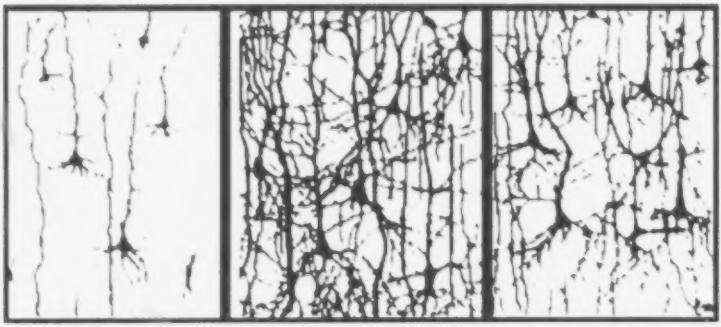
Adapted from ***Rethinking the Brain*** *by Rima Shore. (New York: Families and Work Institute, 1997.)*

How Do Brain Cells Form Connections?

The human brain is made up of cells. At birth, a baby has 100 billion brain cells. These cells are not yet connected in networks as they will be when the brain is mature.

Pet scans reveal that during the first three years, a baby's brain forms trillions of synapses that will create the pathways for speech, thinking, and emotions.

The child forms these synapses in direct response to what he sees, hears, smells, tastes, and feels. A single cell can connect with as many as 15,000 other cells.



At Birth **6 Years Old** **14 Years Old**

Drawings used with permission of Dr. Harry Chugani.

From birth, the brain rapidly creates these pathways. In three years, a baby's brain has formed about 1000 trillion connections, about twice as many as adults.

Frequently used pathways grow into an intricate scaffolding for the mature brain.

Beginning at about age 11, a child's brain gradually "prunes" extra connections.

When a connection is used repeatedly in the early years, it becomes permanent. In contrast, unused pathways wither away.

Behavioral Effects After Prenatal Drug Exposure

Effect	Alcohol	Cocaine	Nicotine
Hyperactivity	✓	✓	✓
Attention Deficits	✓	✓	✓
Aggressiveness	✓		
Impulsivity	✓	✓	✓
Impaired Sleep	✓		
Feeding Difficulties	✓	✓	
Cognitive Delays/ Learning Difficulties	✓		✓
Irritability	✓		
Fine and/or Motor Impairment or Delay	✓		
Impaired Ability to Adjust to New stimuli or Situations	✓	✓	
Retardation	✓		
Physical/Facial Deformities	✓		

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Soothing a Fussy Baby

A parent can teach a baby self-soothing beginning around four months.

- ✿ Hold baby close and breath slowly.
- ✿ Talk to baby, cuddle and rock.
- ✿ Walk the baby.
- ✿ Some infants like to be swaddled.
- ✿ When a baby under a year cries, immediately go to him and make sure he sees you.
- ✿ If the baby does not need to be fed or changed, wait five seconds to pick him up while offering comforting sounds and words.
- ✿ Stroke and gently pat baby.
- ✿ Try to help baby find her fist to suck on.
- ✿ Play soft music, dance with the baby, sing to the baby.
- ✿ Give babies over six months a comfort object such as a stuffed animal or a blanket.
- ✿ Carry the baby in a baby close to you.
- ✿ Push the baby in a carriage. (It is not safe to leave babies sleeping in a carriage unattended unless he is on his back or side and there are no pillows, extra blankets, or large plush toys to impede breathing.)

Talking to a Baby: Age by Age Guide

1 - 3 weeks
Newborns can easily be overstimulated. Feel free to talk to the infant in these early weeks.

1 month to 3 months
Babies this age take in a lot, but cannot process much at once. Reduce background noise as much as possible by turning off the radio and TV when you're talking.

3 to 6 months
Talk to the baby directly. Keep up a running narration. Offer a play-by-play description of your activities: "Now I'm putting on your shirt." Speak as though the baby understands every word. She will not understand, of course, the will store the sounds for when she begins to speak.

6 to 9 months
Now a baby recognizes patterns of sound and can distinguish between different tones of voice. When she hears, "No" she will not get the meaning of the word, but she will recognize the urgency in the tone of voice. After eight months, babies begin responding to simple commands.

9 to 12 Months
A baby's understanding of language accelerates during the last three months before his first birthday. He starts assigning more meaning to the language he hears. To help him, use more signs and gestures when you speak. Point to your mouth, while saying, "Let's get some juice."
*Adapted from "The Smartest Thing You Can Do for Your Baby," **Parenting**, August 1997.*

Finding Quality Child Care

The brain develops nonstop, so high quality child care is very important. A child care provider helps shape experiences that develop a child's brain. Children need care-givers who respond to their emotional and physical needs. Finding quality child care is a challenge.

- Look for teachers who appear that they want to be with your baby, enjoy your particular child.
- Teachers should interact with children in a warm, sensitive way. Check and see if toddlers feel free to run to a teacher for a hug.
- Teachers should be attentive. Look for teachers who get down to the child's level and talk individually to each child individually.
- Find teachers who are knowledgeable. Check their training. A college or associate's degree in child development is a good sign. Check teacher turnover. Children do not like the disruption of losing their teacher.

Other signs of good child care include:

- Happy looking babies who appear relaxed, rested and are not regularly cranky.
- Toys that stimulate the senses.

The National Assn. for the Education of the Young Child sets the following guidelines for supervision:

- One adult caring for 3-4 infants.
- One adult caring for 4-6 toddlers.

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